RELATED APPLICATION DATA

The present application claims priority under 35 USC 119(e) from U.S. Provisional Patent Application No. 60/215,558 (Attorney Docket No. MO15-1001-Prov) entitled "INTEGRATED ACCESS DEVICE FOR ASYNCHRONOUS TRANSFER MODE (ATM) COMMUNICATIONS"; filed June 30, 2000, and naming Brinkerhoff, et. al., as inventors (attached hereto as Appendix A); the entirety of which is incorporated herein by reference for all purposes.

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The present application is also related to U.S. Patent Application Serial No. 09/896,418 (Attorney Docket No. MRNRP004), entitled "TECHNIQUE FOR IMPLEMENTING FRACTIONAL INTERVAL TIMES FOR FINE GRANULARITY BANDWIDTH ALLOCATION", naming Brinkerhoff, et. al., as inventors, and filed concurrently herewith; the entirety of which is incorporated herein by reference for all purposes.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to data networks, and more specifically to a technique for implementing connection shaping control at the customer or end user portion of a data network.

Description of the Related Arts

Conventionally, customer entities desiring access to high bandwidth communication lease their high bandwidth connections from one or more service providers. Such leased connections are typically implemented in accordance with a Service Level Agreement (SLA) between the service provider and the customer entity, whereby, for a predetermined fee to be paid by the customer entity, the service provider agrees to provide a guaranteed amount of bandwidth on the leased line to the customer entity.

FIGURE 1A shows a simplified data network 100 which includes a leased communication line 105 which connects customer entity 102 to the service provider

best effort traffic generated by customer entity 102 on line 105 will be limited to 1.7 Mbps. Moreover, since the preempt data parcels have been configured to resemble non-meaningful data parcels in accordance with standardized protocol, it will appear, from the perspective of the service provider, that the customer entity 102 is using only up to 1.7 Mbps of bandwidth on line 105.

It will be appreciated that the technique of the present invention may be used to dynamically allocate bandwidth resources based upon any number of best effort and/or guaranteed service flows associated with customer entity 102. For example, referring to FIGURE 1A, let us assume that the service provider 104 has agreed to provide customer entity 102 with 1.5 Mbps of bandwidth during peak hours, and 2.0 Mbps of bandwidth during non-peak hours. Further, it is assumed that the peak bandwidth capacity on line 105 is 3.0 Mbps. In this example, a plurality of preempt client flows may be set up at the customer entity 102 for dynamically preempting bandwidth on line 105 during peak and non-peak hours. For example, a first preempt client flow may be established to preempt 1.0 Mbps of bandwidth from line 105, which may be active at all times. Additionally, a second preempt client flow may be implemented to preempt 0.5 Mbps of bandwidth on line 105. This second preempt client flow may be configured to be active during peak hours, and non-active during non-peak hours. As a result, the effective usable bandwidth on line 105 will be 1.5 Mbps during peak hours, and 2.0 Mbps during non-peak hours. Additionally, as explained in greater detail below, the connection shaping technique of the present invention may be used to limit the effective usable bandwidth on a particular communication line for both guaranteed and best effort service flows.

FIGURE 2 shows a block diagram of a specific embodiment of a portion of a data network which may be used for implementing the connection shaping technique of the present invention. The embodiment of FIGURE 2 is described in greater detail in U.S. Patent Application Serial No. 09/896,418, entitled "TECHNIQUE FOR IMPLEMENTING FRACTIONAL INTERVAL TIMES FOR FINE GRANULARITY BANDWIDTH ALLOCATION" (previously incorporated herein by reference in its entirety for all purposes). Pending

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As shown in the embodiment of FIGURE 2, a scheduler 204 is configured to service a plurality of different client processes which may have different associated line rates. The client processes store their output data cells in